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ABSTRACT

Education in East Germany is discussed in this paper. The introduction provides a brief survey of educational reform in East Germany since 1945. Seventy-five percent of the teachers in service up to 1945 were dismissed because of their fascist and militaristic attitudes. New teachers were trained. All young people, irrespective of their parents' social position, were given equal access to education. Various forms of linking instruction and productive work, including polytechnical instruction, vocational training, and technical schools were begun. The paper then goes on to discuss one of the basic principles of the socialist school--the linkage of school and life. Experimental activities, field trips, children's and youth's organizations, industry or agriculture sponsored activities, exhibitions, and fairs are discussed as methods for making school more relevant to students. Today in East Germany almost every school has a sponsor factory of its own. Each sponsor contract includes concrete measures for one year. Skilled workers, engineers, artists and scientists visit classes, organize field trips, and develop slide shows for students. The implementation of the polytechnical principle in mathematics, in the natural sciences, and in the social sciences is discussed. Polytechnical instruction in crafts, gardening, and technical drawings is also examined. (Author/RM)

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On the Democratization of Education in the GDR

Experiences in, results and tendencies of the democratization of education, especially through the close linkage of school and life with special emphasis on the role of productive work

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Introduction

The right to education is regarded as a matter of course by every citizen, by all young people of the GDR. The Constitution of the GDR lays down that, for implementing this right through the socialist educational system, basic conditions have to be created so that every citizen can develop his abilities and unfold his talents unhindered, in free decision, for the welfare of society and for his own benefit. Free from exploitation, oppression and economic dependence, every citizen has the right to put into practice the freedom and dignity of his personality. /1/

Every citizen has an equal right to education, and educational facilities are open to all. The integrated socialist educational system guarantees every citizen a continuous education, training, and further education. /2/

During the 30 years of existence of the GDR, all spheres of life of this country witnessed profound changes giving rise at the same time to an educational system which serves the interests of the working people. A brief survey of the school-political development of the GDR beginning in 1945, which is given from the aspect of the democratization of education, should make better understandable the positions and experiences the country gathered in education in general, and the foundations and objectives, the content, forms and methods of the current practical linkage of school and life, of instruction and productive work in particular.

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After the liberation from fascism in 1945, the prior task of school policy was to eradicate fascist school, to do away with the chaotic conditions caused by fascism and war in all educational facilities, and to build up a new democratic school for all children of the population. The deprivation of the big bourgeoisie and the junkers of their power, the destruction of the imperialist state

machinery, and the setting up of democratic administrative authorities served as a basis for the successful completion of the antifascist democratic school reform. Allied with peasants and other working people, the working class regarded the struggle for a progressive school system always as an element of its struggle for social progress, for democracy and socialism. Thus the building up of a new school was a result of this struggle and at the same time an important condition for the later construction of the socialist society. The rigorous abolition of the traditional unjust ownership relations, of reactionary ideologies and undemocratic privileges was a basic condition for the democratic development of school.

Immediately after the defeat of fascism, the Deutsche Verwaltung für Volksbildung (German Administration of Education) was set up in the Soviet occupation zone. This measure helped to remove the regional splitting up of the school system, which had prevailed in Germany so far, in the area being today the territory of the GDR. A uniform school-political and pedagogic management was a substantial condition for implementing the antifascist-democratic school reform.

75 per cent of the teachers who had been in service up to 1945 had to be dismissed from their profession due to their fascist and militarist attitudes and active participation in fascist and militarist organizations. 40,000 teachers were lacking. The antifascist-democratic school administrations called for young workers, peasants and other working people to be active as "new teachers" (1945/46: 15,000; 1946/47: 25,000). This required new facilities of training and further education in order to prepare the new generation of teachers for their great tasks and to qualify them continuously.

Progressive teachers of that time had to fight tenaciously to gradually overcome the reactionary ideas

which had also lodged already in the minds of children. They made the children detest fascism and war and helped them to accept humanistic and democratic ideals. Anti-fascist workers often engaged in the prevention of attempts to further spread reactionary ideas, and supported the new school in various ways. Consequently, a characteristic feature of that time was that the progressive, antifascist-democratic forces of the population had a substantial share in the determination of the content of education.

The first textbooks, the publication of which was supported by Soviet authorities, were highly conducive to the reeducation of children. At the same time, all libraries existing inside and outside schools were cleared from fascist and revanchist works.

"The democratization of the German school made it also necessary to reorganize the elementary school. Being a general school for the children of the working people, it had imparted so far only fragmentary, unscientific knowledge. This was, nowever, in contrast to the basic democratic task of the educational system to substantially raise the educational level of the population and to put it in line with the demands made by the antifascist-democratic construction." (/3/, p. 47)

In 1946, the Länder parliaments of the former Soviet occupation zone of Germany passed an Act on the democratization of the German school. It was the first time that a German Education Act provided for "educating the young people free from nazi and militarist views in the spirit of the peaceful and friendly coexistence of peoples and genuine democracy to true humanity." /4/ Further, the Act provided to educate the young people to independent thinking and to impart to them a sense of responsibility so that they are able and prepared to do their best for the community. The hierarchy of elementary, secondary and high schools was replaced by a democratic comprehensive school which granted

equal access to education to all young people irrespective of their parents' social position, of their world outlook, religion and sex, and which opened to them the possibility of university education.

The situation in the countryside was especially complex since it was necessary to do away with the great many single-form schools, to set up central schools and thus to ensure equal possibilities of education to the rural population.

Up to 1949 it was possible to accomplish the tasks of the antifascist-democratic school reform, which was an integral part of the antifascist-democratic transformation of the overall social conditions, on the present-day territory of the GDR. The democratic forces' complicated struggle in the material and ideological spheres resulted in an antifascist-democratic educational system where all reactionary elements were eradicated and all intellectual and cultural values of German history were preserved and where already elements of a future socialist educational system began to emerge. /5/

The foundation of the GDR on 7 October 1949, the construction of the fundamentals of socialism, and the implementation of socialist relations of production determined the development of the educational system in the GDR between 1949 and 1962/63.

In the early fifties, the educational system was charged to offer each child to chance of an overall development of his body, mind and moral, and to form young people who take a conscious part in the socialist reconstruction, who are able and prepared for this cooperation.

Ten-year schools began to work in 1951. The organization of the ten-year general secondary school, which was designed to further raise the educational level of the population, was a long-term process during which the complex

conditions required were gradually created (in terms of content, material, funds, staff). "In the process of the socialist transformation of the educational system it was possible to establish a close connection between all educational facilities and socialist reconstruction, real life.

The introduction of polytechnical instruction (1958) and the various forms of linking instruction and productive work were highly significant in this respect. The further setting up of central schools helped to overcome the backwardness of the school system in the countryside, a heritage of the class rule of junkers and the big bourgeoisie." /6/

Since 1951, thousands of elected fathers and mothers have been cooperating in parents advisory councils of schools and parents committees of forms. The Free German Youth organization (FDJ) and the Young Pioneer organization became democratic mass organizations of the children and young people in the GDR already in the early fifties.

New conditions for a much more superior quality of training and studies were also created in the systems of vocational training, technical schools and higher education.

When the socialist relations of production had been implemented in the GDR, the objective and orientation of the further development towards an integrated socialist educational system were characterized in accordance with the transition to the comprehensive construction of socialism (6th Congress of the Socialist Unity Party of Germany - SED -, 1963).

Then in 1965, the Act on the Integrated Socialist Educational System was adopted as a long-term programme of education policy. "This Act is the first in the history of German education to provide for the unity and continuity

of all educational facilities and endeavours run and undertaken by the government and social organizations with a view to educating universally and harmoniously developed socialist personalities." /7/

The first step to implement the new Act was the new determination of the objective and content of general education[1)] for the ten-year general polytechnical secondary school being the compulsory school for all children of the population, and for the subsequent two-year extended general polytechnical secondary school leading to university entrance qualification (integrated curricula for forms 1 to 12).

"After thirty years of development it becomes apparent that the GDR's educational system was able to achieve its recognized efficiency because fundamental political changes such as the liberation from exploitation and oppression, public property of the means of production ... had created the social conditions required in this respect." /8/

On the other hand, the great progress made in the educational system rendered a substantial support to the social development and largely contributed to considerably raising the educational level of a great proportion of the population, to a genuine revolution in the minds and attitudes of millions of people.

The Central Committee of the SED stated in its report to the 9th Party Congress that today the characteristics of socialist personalities emerge ever more clearly. "They are people with a well-founded education and ideological conviction, with wide horizons, they are conscious and active constructors of the new world of socialism and

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1) Measures adopted with regard to vocational and technical schools and to schools of higher learning cannot be described in this context.

communism. The advanced socialist society ... has to create political, ideological, social, intellectual, cultural and material conditions safeguarding the full development of social relations and of man's physical and mental capacities." /9/

The 9th Party Congress particularly emphasized the importance of knowledge, of consciousness, of a scientifically founded theory for the social practice, for the further development of society and stressed that this theory is established and completed by the people's conscious action according to scientific laws.

Resulting consequences and standards for the present-day and future socialist education were also in the focus of deliberations of the 8th Pedagogic Congress of the GDR which took place in October 1978. In a declaration of intent the participants stated: "We are aware of our social task to form a young generation with an allround education, who loves work, who constructs together with all working people of this country an advanced socialist society, who constantly strives for better results, who is well prepared for life." /10/

1. The principle of linking school and life

1.1. Basic theoretical dispositions

The linkage of school and life is one of the basic principles of socialist school. It ensures that the pupils are educated in a realistic way during all phases of education. Maintaining various relations to different spheres of the socialist society, school is closely connected with all social development processes. This allows the school to organize the process of education in a way to comprehensively prepare the future citizens for life so that they can always master the dynamically developing requirements of the social practice.

The principle of linking school and life is applied already to the selection of the contents of general education. The comprehensive development of personality necessitates systematic studies of the fundamentals of contemporary science and technology, ideology, art and culture and of the role of man in the process of production.

This made it objectively necessary to make the bases of the socialist production process as the most important sphere of the social practice itself a subject of socialist general education. From this aspect it was necessary to determine the value of the individual components of general education for the comprehensive development of personality more precisely. When the overall concept of socialist general education was developed, it had therefore to be ensured that educational spheres such as mathematics and natural sciences, technology and economics, social sciences, mother tongue and foreign languages, literature, art and physical culture are assigned a place in the overall educational framework which corresponds to their importance in life, in man's activity in the socialist society. Further it had to be ensured that the entire content of general education must permit a close connection

of instruction, productive work, activities in the field of politics, social affairs, aesthetics, culture and sports. Thus the content of general education is no static quantity but also subject to changes according to the conditions and requirements of the social development. This is a result especially of the influence of the stormy development of science and its role as an immediate productive force, and of the fundamentally changing position of man in the socialist society.

The aspect of realism is also of importance for the selection of the educational contents for the individual subjects and the determination of knowledge and skills to be imparted or acquired. Mainly such concrete contents have been selected which are of importance for the later vocation in the social practice. For instance, mathematics and natural sciences impart scientifically founded knowledge of phenomena and law-governed processes occurring in nature and their utilization by man in production and life in general. Polytechnical instruction makes the pupils familiar with the system of social production, phenomena and conditions of the scientific and technological revolution and basic law-governed processes of technology, technical equipment and the national economy. Polytechnical instruction such as any other subject serves to impart basic skills and a socialist attitude towards work which includes the formation of valuable properties and steady habits. Instruction in the field of social sciences gives information on law-governed processes and connections of the social development, of the historical process, of the social relations between the people, of the state, of economy and law. It imparts the scientific ideology of the working class and thus gives an orientation for activities and behaviour in the socialist society.

Instruction in the subjects of literature and art opens up the resources of art and culture for the comprehensive development of the personality, for the development

of artistic activities and the organization of a rich and cultural life.

The principle of linking instruction and life, theory and practice equally applies to instruction in all subjects. In this respect, fundamental laws are not only imparted systematically but at the same time the pupils are made familiar with the effects of such laws in the concrete social practice. Another important element of a realistic organization of instruction is the constant utilization of experiences and knowledge which the pupils have already gathered from their personal surroundings and especially during their work in production enterprises. The integration of the pupils' experiences from work and environment into instruction makes them more eager to acquire fundamental laws of nature and society and helps them to better understand such laws.

The experimental activities of pupils are especially important for the practice-oriented organization of natural-scientific and polytechnical instruction. The socialist state has provided schools with a great many funds, so that the pupils in all relevant forms can carry out experiments in subjects such as biology, chemistry, physics, crafts and introduction to socialist production. By means of experimental activities the pupils get an insight into the effects of laws and connections they have been familiarized with, and they acquire new knowledge through their own intellectual and practical activities.

Experimental activities further serve to develop personality traits such as exactness, conscientiousness, perseverance etc. The organization of excursions is another possibility of linking school and life, which is also widely used. When the pupils visit enterprises, agricultural production cooperatives and also museums, art exhibitions etc., they get a deeper insight into the complexity of life in a socialist society. Their theoretically

acquired knowledge is strengthened and deepened through observations and experiences in practical life. The pupils recognize that the facts they have learned in school correspond to reality and that they are at the same time necessary for successful acting in society. The inclusion of merited workers in excursions or their appearance before the pupils in the school itself is of great value for education. It serves to form examples who are in line with the socialist society.

Apart from the above mentioned forms of linking school and life, there is a number of other possibilities deriving from the particular situation of school in a socialist society. The socialist children's and youth organization plays an important part in this respect. It makes a substantial contribution in the system of educational measures. It is both the centre of developing activities and initiatives for the benefit of society and the leading political force in the pupils' collective. The children's and youth organization gives adolescents many opportunities of standing the test of living in a socialist community. There they gather first experiences how democracy is implemented in our society. Teachers rely on that organization in their educational work and give it advice and support. The activity of the children's and youth organization is aimed at promoting the activity of each pupil, at inducing to him a sense of responsibility for the collective and for the life at school. For this purpose the children and young people take an ever greater share of responsibility in the organization of the learning, working and living conditions at school.

Another possibility of linking school and life, i.e. the close relations to enterprises of socialist industry or agriculture, is discussed in another chapter.

Since the school is at the same time a social centre in the residential area, it is possible to establish a variety of relations to the social life of the pupils'

immediate environment. By means of exhibitions and fairs, the pupils display the results they have achieved at learning and working. They show artistic performances in the framework of events organized in the residential area, and they care for the aged. On the other hand, citizens of the residential area support the school in their capacity as heads of interest groups and working groups, they render support to renovation activities, the improvement of local amenities etc. This permanent interaction between school and residential area is also conducive to the pupils' organic incorporation into the social life of their environment and their preparation for an active participation in practising socialist democracy in the local sphere.

1.2. The principle of linking instruction and productive work

The close connection of instruction and productive work is an indispensable element for implementing the principle of the unity of school and life. This element is a characteristic feature of socialist school, an expression of the translation of the findings of Marxism/Leninism to the basic relations existing between work and education. Marx in his "Capital", for instance, already referred to the fact that education in the future ... "will connect productive work with instruction and gymnastics for all children having reached a certain age, not only as a method for increasing social production but as the only method for producing comprehensively developed people." /11/

For this reason, the realization of the objective to form comprehensively developed socialist personalities was and is possible only through integrating productive work as an essential means of education.

The linking of instruction and productive work was, at the same time, the most important condition for over-

coming the traditional separation of intellectual and physical education and was an important element of school policy to break the monopoly of learning of formerly privileged classes. The linking of instruction and productive work was a decisive condition for a comprehensive and high educational level of all strata of the population and an essential prerequisite for the people's active participation in the planning and management of society and production.

Instruction and productive work have been closely connected in GDR schools for more than twenty years. The young people are made familiar already at school with the most important sphere of socialist society, i.e. socialist production. Together with their classmates and the workers they do productive work.

This has a decisive impact on education to a proper attitude towards working. Being active in the productive sphere, the pupils acquire knowledge, skills and habits connected with work. They develop dexterity and build up their physical strength. Work sets high standards of discipline, perseverance, exactness, orderliness and reliability and thus promotes the development of important attitudes and behaviour patterns and of valuable motivations for learning and working as a whole. The linking of instruction and productive work also substantially serves to intensify instruction in other subjects since the pupils can apply and test their acquired knowledge with the aid of practical work. This substantially contributes to strengthen and deepen their knowledge.

Productive work helps them also to gather experiences and insights facilitating the acquisition of new knowledge.

This constant interaction between the acquisition of theoretical knowledge and the testing and application of such knowledge in practice is substantially conducive to

the development of general intellectual abilities and capacities.

The linking of instruction and productive work creates also favourable conditions for vocational orientation in the general school, which is in accordance with the demands of the socialist society. At the same time, the transition to vocational training is made easier.[1)]

The linking of instruction and productive work is implemented in various ways:

- through a close connection of learning and working in crafts and in gardening (in the school garden) in forms 1 - 6;
- through the pupils' productive work in "Polytechnical Cabinets" (pupils' workshops in enterprises) in forms 7 and 8, and immediately in production and together with the workers in industrial, agricultural or building enterprises in forms 9 and 10;
- through performing tasks in renovation or improvement campaigns in schools, the attending to public parks and gardens etc.;
- through the participation in working groups for subjects of natural sciences and technology;
- through scientific-practical work in forms 11 and 12 in the extended secondary school;
- through voluntary productive work during holidays, e.g. participation in "camps of recreation and work".

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1) All ten-year school graduates not attending continuing educational facilities take up, as a rule, a two-year vocational training. This implies that twelve-year schooling is granted, in fact, to all pupils in the GDR. An apprenticeship and a relevant job are guaranteed for every school graduate.

2. The implementation of the principle of linking school and life in the socialist school of the GDR

2.1. The influence of the working class and other working people on the education of the school youth

Today, almost every school has a sponsor factory "of its own" and every form a sponsor factory team "of its own" in the GDR. Their interaction has become already a standard of social life and a matter of course. The 9th SED Congress underlines the importance of this immediate influence of working teams. This statement is also referred to in the following quotation: "The fact that the working class has a direct share in the education of the young generation, that our young people experience already at school the struggle of the working people, that they do productive work together with working teams - all this is invaluable for personality development, for the education to a communist working morale." /12/

Heads of schools and management teams of enterprises take a great share of responsibility in the development of these cooperation relations, with much room for personal initiatives. For instance, agreements are made in binding sponsor contracts between

- the heads of a school and an enterprise management, the "sponsor enterprise", with the executives of youth organizations being substantially involved on both sides, and
- individual forms and sponsor teams.

Sponsor contracts include concrete measures for one year in each case. In most cases they refer to the integration of workers (skilled workers and engineers as well as artists and scientists) into the life of individual class teams. Such measures often focus on:

- visits of the class to the sponsor factory, the workplace of the sponsor team,

- participation of the class in festive events of the enterprise,
- organization of joint excursions of the class with the working team,
- organization of slide shows by the sponsor team which are often completed by cultural performances of the class,
- observation of lessons by members of the working team,
- discussions with individual or several pupils on questions of the attitude to learning and working,
- cooperation of a representative of the working team in the parents committee of the form,
- stimulating participation of the working team in pupils' competitions,
- joint productive or socially beneficial work of working team and form, e.g. laying out of flower beds in the enterprise or school premises, preparation of wall newspapers on particular occasions, joint salvage collections etc.

In this respect, the school managements have the following tasks:

- popularization of the various initiatives of individual working teams and forms through exchange of experience, and generalization of the best examples,
- promotion together with enterprise managements of the efficiency of the sponsorship for the pupils mental, political and moral education,
- invitation together with enterprise managements to give yearly account on accomplished activities.

Most sponsorships are characterized by the fact that the influence of working teams covers all spheres of working, learning and living of the pupils, polytechnical instruction and other subjects, the support of the work of the children's and youth organization, the organization of leisure time and, to an increasing extent, also family education.

Sponsor teams have mainly the task to promote, stimulate and motivate the pupils with a view to developing their personality in a comprehensive way.

2.2. The implementation of the polytechnical principle in all subjects of instruction in the ten-year general secondary school, and in working groups

A generalizing analysis of the curricula of all subjects of instruction of the ten-year secondary school in the GDR shows that the polytechnical principle is implemented in such curricula by

- the acquisition of sound knowledge and skills ready for application in each subject

and by specific technical contributions designed to

- become aware of the progressive and educationally effective atmosphere of social production, which the pupils experience in the course of productive work,
- recognize the main tendencies of scientific and technological progress,
- impart basic knowledge in terms of natural and social sciences of important techniques in essential branches of production,
- develop basic knowledge and skills with regard to the handling of important instruments, especially in experimentation,
- develop abilities concerning the planning of intellectual and intellectual-manual activities which are flexibly applicable in many jobs,
- become acquainted with job profiles of important vocational groups and to recognize their importance for the national economy,
- recognize one's own capacities and to coordinate individual desires for a job with social necessities,
- recognize the importance of social work as a driving force of any social development,

- recognize the importance of socially beneficial work as an important element of life and a source of personality development,
- become acquainted with the standards of behaviour of a socialist producer in his job and everyday life, and to identify with such standards.

In this respect, the individual subjects of instruction have to make their specific contributions.

Concrete advice concerning the objectives and preparation of such contributions is given in the curricula of subjects. Advice in detail, discussions and problem solutions for organizing instruction with a view to linking school and life and implementing the polytechnical principle are published also in special periodicals which are monthly issued for the teachers of each specific subject.

Some possibilities of implementing the polytechnical principle shall be dealt with in detail in the following. A major part of such possibilities has been prepared through long-term methodological work in subjects of mathematics, natural sciences and social sciences.

. <u>The implementation of the polytechnical principle in the instruction in mathematics and natural sciences:</u>

Even the impartment of deep insights and sound knowledge on processes and laws in mathematics and natural sciences is often motivated with their use in social practice, especially the practice of production, and leads to the mastery of such processes and laws. Some principles of thought, for instance, are of systemizing effect. They are given emphasis both in <u>instruction in physics</u> and polytechnical instruction:

- finding out of transformations of energy in natural and technical processes to better understand the nature of such transformations,

- model-like interpretation of phenomena occurring in substances (especially materials) with the aid of a particle model,
- emphasis of the purpose-means relation in the case of concrete decisions on the constructive design of machines and implements,
- analysis of a flow of energy through technical constructions which are dealt with in connection with physical circumstances,
- presentation of functional groups as "black box" and combination of such groups in schematic graphs, especially in the separation of the main sub-assemblies of machines etc.

Physics is also highly conducive to developing abilities and skills in experimentation:

- Preparation, carrying out and analysis of physical and technical tests according to established algorithms and with increased room for decisions,
- testing and measuring under technical aspects, which help to provide pupils with a sense of responsibility,
- handling and maintenance of testing and measuring instruments,
- application of mathematical procedures for solving physical and technical problems,
- flexible application of scientific literature in the learning and working processes etc. /13/

Instruction in natural sciences contributes to establishing important concepts and statements which have to be regarded as an essential basis of the polytechnical educational potential of the socialist school. There is often coordination between particular subjects, for instance:

- Crafts (forms 1 to 6) focuses on graphically perceivable phenomena and impart, on this level, the function of simple construction and switching elements (e.g. the transformation of the rotary motion in simple gear

mechanisms, structure and operating method of incandescent lamps, of switches, of the fuse in the electric circuit etc.).

- Instruction in physics is consciously based on these experiences and the attempts of concept formation to make possible a quantitative understanding of the laws concerning the function of construction and switching elements (e.g. effects of the principle of the lever, law, principles in simple and branched circuits etc.).
- The subject "Introduction to Socialist Production" refers to these laws and extends their field of application to important spheres of practice (e.g. transformation of torques in gear units, design of electrical connections under the aspect of saving material and energy etc.). This extension of the "polytechnical horizon" must be prepared already through instruction in physics.

Instruction in chemistry imparts fundamentals of a discipline which is also the basis of production-determinant industrial branches. "The pupils become acquainted with the technical importance, the deposits and the extraction of substances and their specific use in various branches of production and in other spheres of everyday life ... By means of appropriate examples the pupils acquire fundamental facts of the technical description of chemical reactions. Chemical foundations of production processes and often important reaction devices as well as principles of the technical organization of reactions are the subjects of instruction." This helps to develop the conviction that "the findings of science under socialism unrestrictedly serve to promote prosperity and culture, to satisfy the material and cultural needs of the working people and to protect their achievements by military force." /14/

Due to its practice-related approach, instruction in chemistry offers an "abundance of convincing facts and

data on the revolutionary change of practice through the application of scientific findings." /15/

The pupils shall recognize the effects of scientific findings on social productive forces such as the importance of the discovery of the chemical equilibrium for the large-scale industrial production of sulphuric acid, ammonia and nitric acid, or the discovery of the quadrivalence of the carbon atom for the development of organic syntheses of technically important products such as synthetic dyes, pharmaceuticals and polymolecular substances. The pupils learn that the structure theory of organic compounds has proved well as a theoretical basis also in the investigation into essential processes of life. They understand that experimentation in chemistry lessons is often to be seen as a model-like reproduction of technical processes. Through such varied connections to practice, instruction in chemistry makes a specific contribution to vocational orientation and guidance, especially in such regions in the GDR where the chemical industry is an important factor.

In biology the pupils "recognize and understand living nature as an important source of the material and intellectual wealth of the socialist society. They learn that this source will be ever more abundant with increased knowledge and technical potential. They must become ... aware, however, of the fact that comprehensive land improvement has become vital for society and that socialism offers better possibilities of a rational use of natural resources than capitalism." /16/ Instruction in biology deals with scientific foundations of agriculture, forestry and fishing, for instance in the subject matter "Breeding of plants and animals".

When the pupils learn something on basic methods and techniques and their importance for the social practice, they shall be made familiar with the content and requirements of biologically oriented jobs. For this purpose,

biology lessons have to refer to facts on the social division of labour and resulting jobs, which the pupils have already learned, and substantial fields of work and distinctive features of biologically oriented economic branches and the relevant local economic structure have to be discussed. /17/ This necessitates coordination with the preceding instruction on local history in the framework of German (see below) and of geography.

Further, the curriculum refers very often to the relations with other subjects of natural sciences and social sciences to make the pupils familiar with the integration of sciences as a condition required for the recognition and change of environment.

Instruction in mathematics plays a special part in the framework of mathematical and natural-scientific subjects. It is true that mathematical concepts and propositions are often more abstract than the majority of concepts and propositions of other subjects of instruction but the historical development of mathematics was often due to practical needs of the society and contributed to satisfying these needs. The high level of abstraction of propositions is even a condition for their universal applicability in various scientific disciplines. These relations have to be demonstrated in mathematics and explained by concrete examples.

The implementation of the polytechnical principle in the instruction in social sciences

The contribution of natural scientific subjects to implementing the polytechnical principle mainly covers fundamentals of specialties and related circumstances which are typical of production. These circumstances have to be interpreted in terms of their importance for economy and society. Social-scientific subjects, especially history and civics, have to focus on the working out of

social, political and economic circumstances. "The point of any activity for the benefit of society is that the acting man is able to activate his knowledge on the laws and prospects of the social process, when he is faced to his environment, and to apply this knowledge to the concrete situation. Only this makes it possible to recognize the objectively existing conditions under which activities must take place, on which the respective measures and the choice of means for their implementation are dependent. During this process of the planning and organization of socially beneficial work it is possible both to acquire new knowledge and to deepen knowledge already acquired." /18/

Instruction in this field is supporting the polytechnical principle because the revolutionizing part of the development of productive forces and their influence on the formation of the production relations can be concretely made clear. When the pupils realize these driving forces and the objective laws governing the effectiveness of such forces, they understand the solution of current tasks and problems in their own country and in the world. In this sense they are made familiar with the problems of developing socialist production relations and with the connected task of developing man as the main productive force, who plays a far more important role under these relations. In this connection, they get a deeper insight into necessary political and economic decisions, in concrete measures of the economic and social policy, which the pupils reconstruct, for instance, by means of appropriate models or which they discuss together with their classmates with regard to the situation in the enterprise they have been made familiar with during polytechnical instruction. Due to this close connection it is quite logical if certain teaching aids, e.g. historical slide series, are used both in the instruction in history and in polytechnical instruction.

The acquisition of relevant knowledge in subjects of natural and mainly social sciences from form 5 on is effectively prepared by the instruction in local history taking place in the framework of German in forms 1 to 4. This instruction is designed to "impart to the pupils in a planned manner basic knowledge on life in our socialist society, on the cooperation with the Soviet Union and other socialist countries, on the work of the working people and on nature." /19/

In this respect the curriculum stipulates the following: In forms 1 and 2, the pupils acquire knowledge by means of examples concerning their parents' work for the benefit of society, the work of the municipal or town council and the tasks to be accomplished by public institutions of their home place. In form 3 they learn that the district town is the political, economic and cultural centre and the traffic junction of their home district. By examples taken from the work of a people's representative of the pupils' home place they shall learn what functions are assumed by deputies, what difficulties they are faced with and what responsible work is accomplished by them. They also deal with a key enterprise of the district and other important industrial and agricultural enterprises.

In form 4, observations are extended to socialist construction in the home county. Also in this case, social, political and economic aspects are included. /20/ and /21/

Also the continuing instruction in German in the upper forms has to accomplish detailed tasks with a view to the polytechnical principle: Numerous literary works are discussed which describe the role of man in production and the confrontation with reactionary production relations, stylistic exercises (descriptions etc.) refer also to tools and machines as objects etc.

An important contribution of the instruction in geography is mainly the fact that the pupils get acquainted with substantial connections between production relations and productive forces and between the economic and social policy when they deal with the national economy. For instance, they have to be enabled to

- analyse economic areas with regard to the economic structure and the regional distribution of productive forces,
- understand the influence of natural, demographic and economic conditions on the development of production,
- evaluate the national and international significance of a production branch or of a location of production,
- analyse and prepare maps and statistical material more and more independently. /22/ and /23/

- The implementation of the polytechnical principle in working groups

The system of extracurricular working groups (in 1978/79 the number of working groups totalled 98,500 counting more than 1.4 million participants) serves to develop special interests of the pupils and helps to prepare them in various ways for the social and vocational life. Some examples taken from the wide range of possibilities shall be discussed in the following:

- There are working groups at schools designed to maintain and construct simple teaching aids and school furniture. Being directed in most cases by teachers specialized in crafts, they do work for the benefit of society, develop manual abilities and skills, dexterous handling of tools etc.
- There are natural-scientific and technical working groups for pupils of secondary forms both at schools and Engineering and Natural Science Centres which are established in almost all districts. Such working groups

are run by persons trained in the field of education as well as by technicians, physicists, chemists, biologists etc.

- In forms 9 and 10 nearly all pupils decide to cooperate in a working group engaged in science, technology, social sciences, culture or art (in 1978/79 the number of such working groups amounted to 18,300 with 228,000 participants). Such groups are organized by the school, directed by appropriate specialized teachers or experts and work in schools or cooperating enterprises. They work according to a central skeleton programme which leaves much room to the organization of learning and working in accordance with local conditions.
- Technical-productive working groups of pupils meeting in appropriate special enterprises have been established for those interested in the repair of motor vehicles, agricultural machinery etc.

The polytechnically oriented part of these working groups is designed to make the pupils, who work together in groups of 6 to 12, better understand their field of interest and solve technical-constructive problems as well as problems of work organization. Results of this work shall be usable for schools or enterprises and are displayed, if they are distinguished by good quality, at "Young Innovator's Exhibitions". Objective, motivation and content of the information required for learning and working are in many respects related to the subjects of polytechnical instruction.

2.3. The implementation of the principle of linking school and life in the framework of polytechnical instruction

The principle of polytechnical instruction is both governing all subjects and a direct subject of instruction in particular specialized disciplines in the socialist school of the GDR. As mentioned above, the instruction in

mathematics, natural sciences and social sciences is the decisive basis of polytechnical education. Sound knowledge and skills in these fields are a decisive condition for the young people's preparation for the permanently growing demands of vocational training and for the activity and creativity in productive work.

This is decisively based on a high quality of instruction in all subjects and the continuous improvement of this quality.

The active, creative role of man in socialist production, the interaction between natural sciences, technology, production and economy require also

- to systematically impart, even in the general school, technical and economic knowledge concerning important fields of socialist production,
- to include the pupils ever more comprehensively in the process of social production through productive work in industrial and agricultural enterprises,
- to educate them to the love of work, to respect for the working people, to develop in them an ability and readiness to work.

Referring to the experiences gathered during 20 years of development, the 8th Pedagogic Congress made the following statement: "Today there is no more doubt that polytechnical training which is directly connected with the production practice, that the carrying out of polytechnical instruction in enterprises has proved to be favourable since it is there that the pupils become immediately faced with a decisive phase of struggle in the construction of a socialist society. The high value of the means of production put into the pupils' hands and the strict demands made on the pupils' discipline, perseverance and reliability by the technological requirements of work in production, the demand of their instructors and teachers to terminate a

piece of work once commenced persistently, consistently and in good quality, are of great importance for the development of moral properties and behaviour patterns." /24/

A varied system of scientific-technological and production-technological working groups and other forms of socially beneficial activities which have already been mentioned offer other possibilities of linking school and life with regard to the pupils' individual interests and inclinations when they are engaged in useful activities.

Polytechnical instruction in the ten-year general secondary school includes:

- instruction in crafts in forms 1 - 6
- gardening (in the school garden) in forms 1 - 4
- polytechnical instruction in forms 7 - 10
  - . Productive work of the pupils
  - . Introduction into socialist production
  - . Technical drawing.

Crafts is designed to systematically impart polytechnical knowledge and skills to the pupils and to make them early familiar with the role of work in society and for society.

Crafts has the following characteristics:

- Practical skills have to be developed when articles for the benefit of the community are made.
- Practical work shall help the pupils to acquire elementary technical, technological and economic knowledge.
- Their abilities in the field of technology and construction shall be developed and promoted through working with construction sets.
- Working and learning is organized in such a way as to refer to previous knowledge of mathematics and elementary knowledge in the field of natural sciences, and to deepen and strengthen this knowledge.

- The general task of educating the pupils to a proper attitude towards working which manifests itself in constantly striving for precise, neat and responsible work, for great care and collective working is, of course, also an inherent element of crafts.

Crafts concentrates on:

- the processing of such materials as paper, cardboard, artificial leather, wood, plastics and metal including the introduction of tools required for such works and their handling up to simple devices and machines;
- exercises with construction sets for construction elements, machine components, technical models and the technical bases of the electric circuit and elementary electrical connections.

Altogether, crafts is of great importance for the pupils' polytechnical education and their education to a proper attitude towards working. Productive work, technical exercises and experiments serve to develop their abilities and skills to an extent necessary for all subjects of polytechnical instruction in forms 7 to 10.

Gardening (in the school garden) serves to employ the pupils with simple gardening works. They till the soil themselves, they sow, attend to the cultures and engage in harvesting. They carry out germination tests, observe the growth of plants, compare varieties, calculate yields, carry out fertilizing, reproductive and breeding experiments. These activities are conducive to the education to a proper attitude towards working and to the love of nature. In agricultural areas, this kind of gardening prepares for later working and learning in fields and agricultural facilities. Just as the programmes for crafts those of gardening (in the school garden) take, of course, account of the children's age, and the level of their physical and mental development.

Polytechnical instruction in forms 7 to 10 as a component of socialist general education theoretically and practically introduces the pupils to elementary connections of technology and production in industry and agriculture and enables them to technical thinking. The pupils become aware of the fact that laws of nature, political, ideological and economic objectives and conditions as well as moral and aesthetic standards are implemented in technology and production. They learn that technology is not only important for society but that it is also highly gripping and interesting, that its acquisition and further development requires hard and creative work.

Polytechnical instruction is a characteristic component of contemporary socialist general education and makes a substantial contribution to the comprehensive development of the pupil's personality.

The subject "Introduction to Socialist Production" includes themes of mechanical technology, practical mechanics, electrical engineering, control engineering and economy, especially of such fields which are of basic importance for the carrying out of productive work and enable the pupil to understand his tasks. The curriculum is largely standardized for all pupils. Referring to knowledge and skills acquired during instruction in mathematics and natural sciences, the pupils are introduced to complex connections of modern production and are made familiar with basic requirements necessary to master the equipment and techniques. To prepare the future producer to an optimum degree for his tasks is an objective which is of basic importance for the determination of content. This illustrates the connection with the subsequent vocational training. Consequently, the syllabus has to include themes which are broadly applicable due to their general validity and themes of spheres which become increasingly important in the whole productive sphere - not only in special

branches - and whose applicability will become ever more comprehensive in future such as control engineering. We do not hide that the problem of determining the content of this field is a very complicated one which has not yet been solved satisfactorily so far but continuous efforts will help to reach this aim.

One task of this subject is to enable the pupils to apply their knowledge to the solution of technical tasks and problems. In this way, the pupils acquire basic knowledge concerning techniques, methods and technologies of scientific, technological and practical work. The ability to make use of knowledge and skills they have acquired especially in mathematics and natural sciences substantially decides on the share of general education in the development of flexibility. Under the aspect of scientific and technological progress, flexibility becomes ever more necessary for the pupils' vocational preparation and also for vocational training itself. Inquiries have shown that a skilled worker has to adapt to new means of production and techniques several times during his professional life so that there is at present a relationship of about 1 : 2 between training and further education. /25/

In addition, this subject together with history, civics and geography has to introduce the pupils to some social, especially economic connections and law-governed processes of the enterprise and productive work.

The subject "Introduction to Socialist Production" (ISP) is divided into the following courses:

- Mechanical technology and practical mechanics
- Bases of production of a socialist enterprise
- Electrical engineering.

The curriculum provides the following items:
- In form 7, introduction to basic techniques such as making of master forms, forming, separating, jointing

and surface refining from technical, natural-scientific and economic aspects;

- in forms 8 and 9 introduction to the structure and function of machines, the rational use of machines, important machine elements and the control of machines and plants, and introduction to bases of socialist production;
- in form 10, introduction to the bases of electrical engineering and electronics with test and measuring techniques, heavy current and light current engineering as themes;
- exercises and experiments are of basic importance to optimize the process of learning. The points of experimentation are the development of mental capacities such as observing, analysing, comparing, classifying, evaluating, recognizing and proving of connections, and thus the development of mental-practical abilities. Together with other subjects of instruction, this is a substantial contribution to developing important individual properties such as planned, careful and exact working, perseverance, ability to criticize, mutual support and team work.

The following example shall serve to illustrate the complex interaction of different sides of personality development such as acquisition of knowledge, development of the readiness and ability to work and understanding of economic connections.

ISP instruction in form 9 makes the pupils acquainted with machine elements and their wide range of application. In this respect, reference is made to laws which are known from instruction in natural sciences (for instance friction, dynamics of solid bodies, stress analysis, transformation of energy etc.) from a technical aspect for the functional consideration of selected objects (such as axles, shafts, bearings, couplings, transmissions). Observations, exercises etc. help to develop the ability to analyse complex systems - in this case machines -, to apply functional connections and

findings to practice. The pupils shall realize the economic importance of standardization for rationalization and co-operation which have effects mainly in the international socialist division of labour. They shall comprehend that this enables the working people to master the tasks of scientific and technological progress with greater efficiency for the benefit of the people.

The building of simple elements helps to further develop the pupils' creativity while knowledge and skills acquired in Technical Drawing are deepened. Experimentation promotes the pupils' striving for knowledge, their independent testing and trying of technical mechanisms. Especially such examples are dealt with which are known to the pupils from their own productive work and from enterprise production. This makes the pupils better understand things and processes when they are engaged in productive work in the field of maintenance or assembly in the framework of manufacture or repair of an enterprise.

Productive work of the pupils is the most important component of polytechnical instruction in forms 7 - 10. The great importance of productive work results from the basic significance of the education to a proper attitude towards working in the process of education which serves to implement the aims of education mentioned above. Consequently, the education to a proper attitude towards working is a decisive element of all spheres of education in the ten-year general polytechnical secondary school. Important properties of the individual such as a sense of social responsibility, socialist attitude towards working, discipline and creativity are developed especially in the process of working. When the pupils have to solve tasks, they can prove that they are able to apply their knowledge and skills.

The productive work of the pupils links learning and working and thus substantially contributes to closely

connecting school and life. As an important sphere of the pupils' social practice it is a substantial field of experience and trial for all subjects of general instruction. Industrial and agricultural enterprises are a decisive basis for the carrying out of polytechnical instruction in a high quality since "the concept of our polytechnical instruction was and is to be implemented only in a close interaction of our general school and socialist enterprises. This orientation was decisively determined by the fact that such an interaction of enterprise and school proved to be an invaluable means for the working class to exert a direct influence on the education of the young generation." /26/

- Working in industrial or agricultural enterprises is a genuine field of trial for the young people. Instructed by experienced workers or cooperative farmers, they can apply their knowledge and skills in production. It has proved to be right that the work in an enterprise, the direct contact with the workers, the workers' creativity and preparedness which the pupils experience themselves, but also the accustoming to perseverance and even monotony, to orderliness and discipline in the process of work have an extremely positive effect on the development of personality.
- In production, the young people can convince themselves immediately of the workers' striving for a high labour productivity and the mastering of scientific and technological progress. In joint productive work with the working people they experience how the possibilities of their own development increase and how their lives become richer through their creativity. They realize that everything we have achieved is a result of diligent and hard work of the population, that work is the basis of life.
- The attitude towards working has proved to be the main question of socialist education. This requires to educate

the young people to respect the working people so that they adapt their thinking, feeling and behaviour to the moral and aesthetics of the working people.

- Various and good conditions exist in production enterprises to implement this great educational task. Their machines and installations, their techniques and their scientific and technological potential are the decisive material basis for the efficient realization of productive work.
- Productive work can also lead to effective educational results with regard to the development of clear ideas of a job and a conscious choice of occupation which are, as inquiries have shown, problems of prior importance among the young people between 13 and 16. The quality of polytechnical instruction plays an important part in the decision for an occupation. In this respect, questions such as the following are significant:
  - the pupil's own activity in the process of production;
  - a good planning of work, the accountability and steadiness of work;
  - the collective organization of work which stimulates persistent and careful working and educates to mutual help, and
  - the organization of productive work in a way enabling and forcing the pupils to apply their knowledge and skills. /27/

Productive work of forms 9 and 10 refers to previous instruction in forms 7 and 8 which is designed to impart to the pupils largely uniform and general knowledge, skills and habits.

The principle of linking uniformity and differentiation, which is a characteristic feature of socialist school policy, is largely implemented in the organization of productive work and of the activity of extracurricular working groups. The promotion and development of individual

interests and inclinations is also a humanistic concern of productive work which is a field of genuine trial of people.

The following spheres of work constitute a uniform framework:

- complex maintenance and assembly activities,
- operation, supervision and servicing of machines,
- carrying out of special operational works.

At present, productive work is differentiated in ten directions according to the necessary flexible adaption to trends of scientific and technological progress in socialist production, the dynamic change of the structure of production and thus in the employment of workers, and with regard to the different regional possibilities and conditions: metal working industry, electrical industry, building, agriculture, chemical industry, textiles, wood working industry, leather working industry, clothing industry and maintenance of agricultural equipment.

This differentiation makes it possible to increasingly direct the pupils' interests to economically important vocations, to directly integrate them into the process of production and thus to relate productive work to practice and make it efficient for society. Social forces are directly included in education through the pupils' immediate integration into production. The pupils are familiarized directy with modern techniques. Their skills are developed to a high level. They are included in processes of work preparation and organization. Enterprises try to assign separated tasks to the pupils so that they are responsible themselves for their solution.

"Where the pupils, within the framework of their workers' emulation, have to see themselves to an economic use of material and energy, to a rational organization of work, to the observation of health and labour safety, where

they are employed themselves as team leaders or quality inspectors, enter themselves production performances in journals and assess them, where they are assigned an estimable amount of responsibility, there the great educational value of polytechnical instruction becomes evident." /28/

In connection with productive work, the pupils are imparted in ISP, according to the directions of differentiation, uniform knowledge of the production targets of the enterprise, its material economy, the main phases of the process of production in the enterprise and on the tasks of the workers, and they are made familiar with jobs offered by the enterprise. In addition, various individual interests are promoted or newly developed, which is encouraged by the unique, extremely favourable atmosphere of production.

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The polytechnical character of socialist general education creates basic general and specific conditions for a modern vocational training:

- Important foundations of personality development, which find their expression, for instance, in the attitude towards working, a sense of social responsibility, readiness to permanent learning, orderliness and discipline, have already been formed in the pupils.
- The pupils are provided with a system of applicable elementary knowledge, abilities and skills as regards technology and economy.
- They have, to a certain extent, developed an ability to refer to knowledge in the field of mathematics and natural sciences when they are to penetrate into technical matters and solve practical tasks.
- The comprehensive general education, which includes a broad, universal education in technical fundamentals,

is an important basis for their flexibility - a substantial problem of contemporary vocational training.

- They have already developed a system of practical knowledge, abilities and skills, and already master elementary operations including the operation of simple machines.
- Through their immediate employment in production the pupils learned what requirements with regard to discipline, morale, intellectual and physical efforts are made on the working people in their vocational life.

The increased level of general education made it possible to reduce the period of vocational training for ten-year school graduates from 3 years to 2 years with the requirements of training being raised, since school imparts, for instance, "during polytechnical instruction fundamental knowledge and skills which represent underlying resources for some 80 per cent of all vocations in our national economy." /29/

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The objectives and contents of polytechnical education, the young people's preparation for life and work cannot be implemented by the educational system alone.

Since polytechnical instruction was introduced in 1959, the GDR party and government leadership have oriented to making this task a concern of the whole society.

Decisions provided that nationally-owned enterprises and agricultural production cooperatives are responsible for the provision of funds, materials and staff and that the working class should exert an active influence on the formation and education of the young generation of skilled workers.

Polytechnical facilities with well-equipped special subject classrooms and pupils' workshops have been established in more than 5,000 enterprises.

About 1 million pupils of forms 7 - 10 are trained weekly in enterprises and their polytechnical centres. The pupils are cared for and instructed by some 8,800 full-time and more than 25,000 part-time instructors, skilled workers and apprentices instructors. /30/

To ensure a high level of instruction in the subjects "Introduction to Socialist Production" and "Technical Drawing", a comprehensive system of teaching aids, especially containing sets of instruments for experiments and tests to be carried out by pupils, has been developed and made available to the enterprises' educational facilities (special subject classrooms, cabinets). Considerable amounts of money have been spent by the state for this purpose.

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The further <u>improvement of polytechnical instruction</u> focuses, for instance, on the following main tasks:

- Since the subject "Introduction to Socialist Production" was introduced, new findings and questions concerning the conceptional, substantial and methodological organization of this subject have emerged which make it necessary to work out new teaching materials, i.e. new curricula, textbooks and methodological aids.
- For the organization of productive work "it is necessary to constantly analyse new trends in production and of the national economy and to examine again and again whether workplaces and tasks for the pupils have been carefully selected in enterprises." It has especially to be taken into account "that the pupils must have the opportunity to go in for such occupations enabling them

to independent working and to assume responsibility for their work themselves. One problem which is highly important but difficult to solve is to face the pupils more directly with the demands of scientific and technological progress. Since we must call the generation we are educating at present to face scientific and technological problems, to help to change them themselves, to seek for more efficient solutions." /31/

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